

Unit 2 - Matter and Energy  
Refrigeration and Air Conditioning Technology

1. A solid material exerts a pressure or force \_\_\_\_\_.  
a. in all directions                      b. downward only  
c. outward and downward              d. outward only

ANSWER:              b

POINTS:              1

REFERENCES:        Matter

QUESTION TYPE:    Multiple Choice

HAS VARIABLES:    False

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2. A liquid material exerts a pressure or force \_\_\_\_\_.  
a. in all directions                      b. downward only  
c. outward and downward              d. outward only

ANSWER:              c

POINTS:              1

REFERENCES:        Matter

QUESTION TYPE:    Multiple Choice

HAS VARIABLES:    False

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3. A vapor material exerts a pressure or force \_\_\_\_\_.  
a. in all directions                      b. downward only  
c. outward and downward              d. outward only

ANSWER:              a

POINTS:              1

REFERENCES:        Matter

QUESTION TYPE:    Multiple Choice

HAS VARIABLES:    False

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4. If the temperature remains constant and the volume that a gas occupies increases, the pressure will \_\_\_\_\_.  
a. decrease  
b. increase  
c. remain the same  
d. cannot be determined from the information given

ANSWER:              a

POINTS:              1

REFERENCES:        Gas Laws

QUESTION TYPE:    Multiple Choice

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5. The volume of gas varies inversely with the absolute pressure, provided the temperature remains constant. This is called \_\_\_\_\_.

- a. Charles' Law
- b. Tom's Law
- c. Boyle's Law
- d. Dalton's Law

ANSWER: c

POINTS: 1

REFERENCES: Gas Laws

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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6. At a constant pressure, the volume of a gas varies as to the absolute temperature and at a constant volume the pressure of the gas varies directly with the absolute temperature. This is known as \_\_\_\_\_.

- a. Charles' Law
- b. Tom's Law
- c. Boyle's Law
- d. Dalton's Law

ANSWER: a

POINTS: 1

REFERENCES: Gas Laws

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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7. The total pressure of a confined mixture of gases is the sum of the pressures of each of the gases in the mixture. This is known as \_\_\_\_\_.

- a. Charles' Law
- b. Tom's Law
- c. Boyle's Law
- d. Dalton's Law

ANSWER: d

POINTS: 1

REFERENCES: Gas Laws

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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8. A helicopter is lifting an 800-pound unit at a rate of 200 feet per minute. How many horsepower of work energy is the helicopter using in the process?

- a. 3.863 hp.
- b. 4.517 hp.

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- c. 4.848 hp.      d. 5.209 hp.

*ANSWER:*            c  
*POINTS:*            1  
*REFERENCES:*      Power  
*QUESTION TYPE:* Multiple Choice  
*HAS VARIABLES:* False  
*DATE CREATED:*    3/12/2015 12:21 PM  
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9. The unit used to measure electrical power is the \_\_\_\_\_.  
a. volt      b. ampere  
c. watt      d. ohm

*ANSWER:*            c  
*POINTS:*            1  
*REFERENCES:*      Electrical Power  
*QUESTION TYPE:* Multiple Choice  
*HAS VARIABLES:* False  
*DATE CREATED:*    3/12/2015 12:21 PM  
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10. One watt of electrical energy is equal to \_\_\_\_\_.  
a. 3.1416 Btu/h      b. 3.413 Btu/h  
c. 3.3416 Btu/h      d. 3.3146 Btu/h

*ANSWER:*            b  
*POINTS:*            1  
*REFERENCES:*      Electrical Power  
*QUESTION TYPE:* Multiple Choice  
*HAS VARIABLES:* False  
*DATE CREATED:*    3/12/2015 12:21 PM  
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11. How many watts of electrical power are equal to 1 horsepower?  
a. 33000.      b. 15000.  
c. 746.          d. 660.

*ANSWER:*            c  
*POINTS:*            1  
*REFERENCES:*      Electrical Power  
*QUESTION TYPE:* Multiple Choice  
*HAS VARIABLES:* False  
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12. Specific volume is the term used to indicate the space a weight of gas will occupy.

- a. True
- b. False

*ANSWER:* True  
*POINTS:* 1  
*REFERENCES:* Specific Volume  
*QUESTION TYPE:* True / False  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
*DATE MODIFIED:* 3/12/2015 12:21 PM

13. As heat is applied to a closed container containing a gas, the pressure inside the container will decrease.

- a. True
- b. False

*ANSWER:* False  
*POINTS:* 1  
*REFERENCES:* Gas Laws  
*QUESTION TYPE:* True / False  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
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14. An example of a fossil fuel is hydrogen.

- a. True
- b. False

*ANSWER:* False  
*POINTS:* 1  
*REFERENCES:* Conservation of Energy  
*QUESTION TYPE:* True / False  
*HAS VARIABLES:* False  
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15. A law of conservation of energy states that energy is neither created nor destroyed.

- a. True
- b. False

*ANSWER:* True  
*POINTS:* 1  
*REFERENCES:* Conservation of Energy  
*QUESTION TYPE:* True / False  
*HAS VARIABLES:* False  
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16. Heat is a form of energy because of the motion of molecules.

- a. True
- b. False

ANSWER: True

POINTS: 1

REFERENCES: Energy Contained in Heat

QUESTION TYPE: True / False

HAS VARIABLES: False

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17. A material that occupies space and has mass is called \_\_\_\_\_.

ANSWER: matter

POINTS: 1

REFERENCES: Matter

QUESTION TYPE: Completion

HAS VARIABLES: False

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18. Matter exists in three states: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

ANSWER: solid, liquid, gas  
solid, gas, liquid  
gas, liquid, solid  
gas, solid, liquid  
liquid, gas, solid  
liquid, solid, gas

POINTS: 1

REFERENCES: Matter

QUESTION TYPE: Completion

HAS VARIABLES: False

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19. The law that states that "energy is neither created or destroyed, but can be converted from one form to another" is called the \_\_\_\_\_.

ANSWER: law of conservation of energy

POINTS: 1

REFERENCES: Conservation of Energy

QUESTION TYPE: Completion

HAS VARIABLES: False

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20. Most of the energy we use comes from something we already have on Earth. The only "new" energy we get comes from the \_\_\_\_\_.

ANSWER: sun

POINTS: 1

REFERENCES: Conservation of Energy

QUESTION TYPE: Completion

HAS VARIABLES: False

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21. \_\_\_\_\_ ft-lb of work is accomplished when an 800-lb condensing unit is lifted to the top of a 40-ft building.

ANSWER: 32,000

32000

Thirty two thousand

POINTS: 1

REFERENCES: Energy Used as Work

QUESTION TYPE: Completion

HAS VARIABLES: False

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22. One horsepower of work energy equals the amount of work done when lifting \_\_\_\_\_ pounds to the height of \_\_\_\_\_ foot in \_\_\_\_\_ minute.

ANSWER: 33,000, 1, 1

33000, 1, 1

Thirty three thousand, one, one

POINTS: 1

REFERENCES: Power

QUESTION TYPE: Completion

HAS VARIABLES: False

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23. The unit of measurement of electrical power is the \_\_\_\_\_.

ANSWER: watt

watt (W)

POINTS: 1

REFERENCES: Electrical Power-The Watt

QUESTION TYPE: Completion

HAS VARIABLES: False

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24. One pound of ice at 20°F exerts its force downward. After absorbing 200 Btus, what direction(s) will the force be exerted? After absorbing 2000 Btus?

*ANSWER:* In the first case, force is exerted outward and downward; in the second, in all directions.

*POINTS:* 1

*REFERENCES:* Matter

*QUESTION TYPE:* Subjective Short Answer

*HAS VARIABLES:* False

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25. Define an atom.

*ANSWER:* An atom is the smallest part of a material.

*POINTS:* 1

*REFERENCES:* Matter

*QUESTION TYPE:* Subjective Short Answer

*HAS VARIABLES:* False

*DATE CREATED:* 3/12/2015 12:21 PM

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26. Define a molecule.

*ANSWER:* A molecule consists of atoms and cannot be broken down further without changing the chemical composition of the substance.

*POINTS:* 1

*REFERENCES:* Matter

*QUESTION TYPE:* Subjective Short Answer

*HAS VARIABLES:* False

*DATE CREATED:* 3/12/2015 12:21 PM

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27. Define density.

*ANSWER:* The mass to volume relationship of a material.

*POINTS:* 1

*REFERENCES:* Density

*QUESTION TYPE:* Subjective Short Answer

*HAS VARIABLES:* False

*DATE CREATED:* 3/12/2015 12:21 PM

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28. Define specific gravity.

*ANSWER:* The ratio of the density of a cubic foot of a material as compared to a cubic foot of water in liquid

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form.

*POINTS:* 1  
*REFERENCES:* Specific Gravity  
*QUESTION TYPE:* Subjective Short Answer  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
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29. Define specific volume.

*ANSWER:* The volume in cubic feet that a one pound quantity of vapor will occupy.  
*POINTS:* 1  
*REFERENCES:* Specific Volume  
*QUESTION TYPE:* Subjective Short Answer  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
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30. Define power.

*ANSWER:* The rate of doing work.  
*POINTS:* 1  
*REFERENCES:* Power  
*QUESTION TYPE:* Subjective Short Answer  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
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*Match the gas law with its properties.*

- a. Boyle's law
- b. Charles' law
- c. Dalton's law

*REFERENCES:* Gas Laws  
*QUESTION TYPE:* Matching  
*HAS VARIABLES:* False  
*DATE CREATED:* 3/12/2015 12:21 PM  
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31.  $V_1 / T_1 = V_2 / T_2$

*ANSWER:* b  
*POINTS:* 1

32.  $P_{TOTAL} = P_{SUBSTANCE 1} + P_{SUBSTANCE 2}$

*ANSWER:* c  
*POINTS:* 1



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33.  $P_1 \times V_1 = P_2 \times V_2$

ANSWER: a

POINTS: 1

Match the following terms with their proper units and/or formulas.

a. Specific volume

b. hp

c. Specific gravity

d. Density

e. 1 kW

f. Work

REFERENCES: Energy Used as Work  
Electrical Power-The Watt  
Specific Volume  
Specific Gravity  
Power  
Density

QUESTION TYPE: Matching

HAS VARIABLES: False

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34. Force  $\times$  Distance

ANSWER: f

POINTS: 1

35. 3413 Btu/h

ANSWER: e

POINTS: 1

36. ft<sup>3</sup>/lb

ANSWER: a

POINTS: 1

37. No units

ANSWER: c

POINTS: 1

38. 33,000 ft-lb/min

ANSWER: b

POINTS: 1

39. lb/ft<sup>3</sup>

ANSWER: d

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

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*POINTS:* 1